

```
#####
#
# Generation of Class 2 by Continued Fractions
#
#####
# Auxiliary functions
#
# Add '1' to the last term
#
add1 <- function(v){
  lastinteger <- tail(which(v > 0), n = 1)
  w <- v; w[lastinteger] <- w[lastinteger] + 1
  return(w)
}
#
# Decompose last term (k-1, 1) and add '1' to last new term
#
decomp.add1 <- function(v){
  lastinteger <- tail(which(v > 0), n = 1)
  w <- v; w[lastinteger] <- w[lastinteger] - 1
  w[lastinteger + 1] <- 2
  return(w)
}
#
#####
#
main.2.CF <- function(system, maxlevel){
  m <- maxlevel # maxlevel > 2; by choice
  a <- matrix(rep(NA, (2^m-1)*m), ncol = m)
  #
  a[ 1, 1 ] <- 1
  #
  a[ 2, 1:2 ] <- c(0,2)
  a[ 3, 1 ] <- 2
  #
  #
  for(n in 2:(2^(maxlevel-1)-1)){
    if(n%%2 == 0){
      if(system == 1 | system == 3){
        a[2*n , ] <- add1(a[n, ])
        a[2*n+1, ] <- decomp.add1(a[n, ])
      }
      if(system == 2 | system == 4){
        a[2*n , ] <- decomp.add1(a[n, ])
        a[2*n+1, ] <- add1(a[n, ])
      }
    }
    if(n%%2 != 0){
      if(system == 1 | system == 4){
        a[2*n , ] <- decomp.add1(a[n, ])
        a[2*n+1, ] <- add1(a[n, ])
      }
      if(system == 2 | system == 3){
        a[2*n , ] <- add1(a[n, ])
        a[2*n+1, ] <- decomp.add1(a[n, ])
      }
    }
  }
  #
  return(a)
}
#
#####
#
# Examples: Build the beginning of all four systems
#
main.2.CF(system = 1, maxlevel = 5) # SB
main.2.CF(system = 2, maxlevel = 5) # Bird
main.2.CF(system = 3, maxlevel = 5) # HCS
main.2.CF(system = 4, maxlevel = 5) # Yurramendi-2
#
#####
```